A. J. WURTS.

LIGHTNING ARRESTER.

APPLICATION FILED SEPT. 5, 1905.

974,223. Patented Nov. 1, 1910.

Fig. 1.

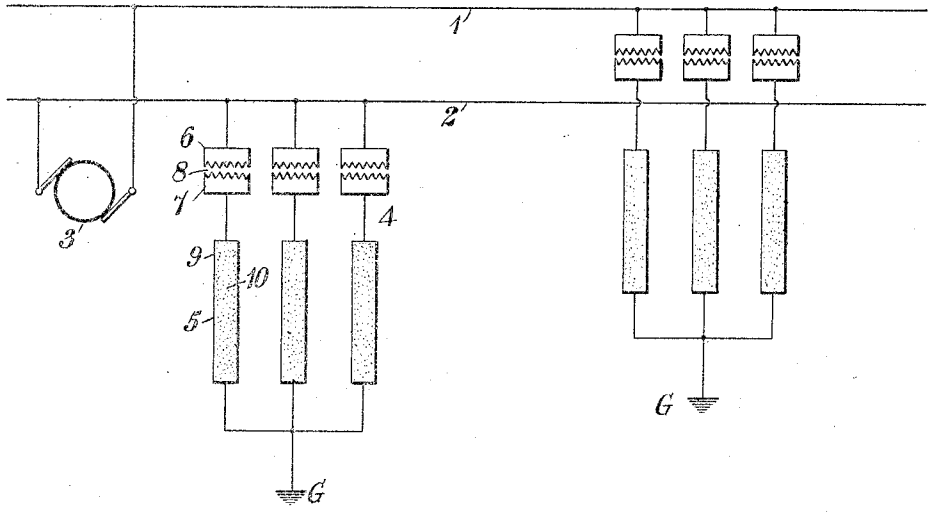


Fig. 2.

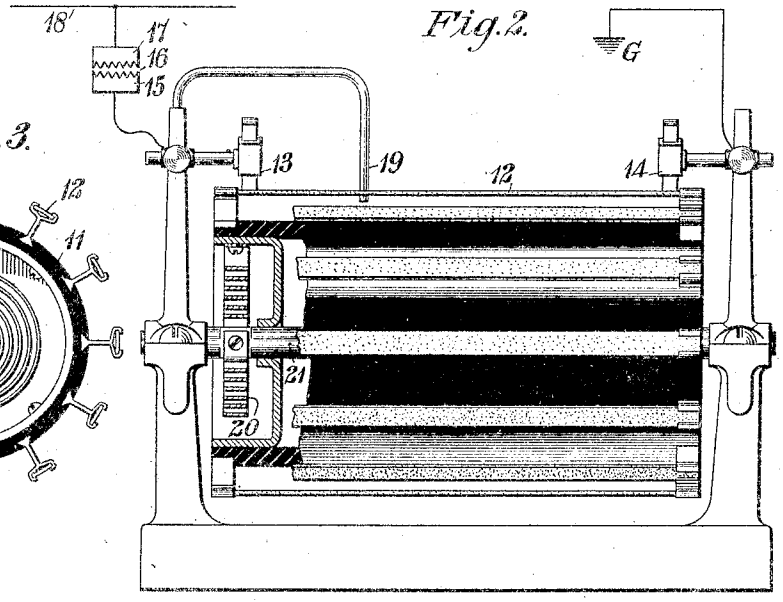
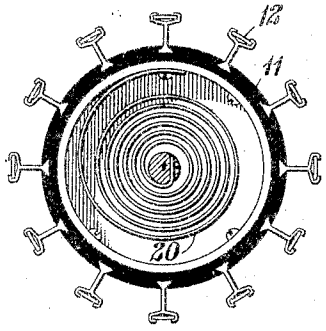


Fig. 3.



WITNESSES:

C. L. Belcher

Otto J. Schairer

INVENTOR

Alexander Jay Wurts

BY

Wesley G. Carr

ATTORNEY

UNITED STATES PATENT OFFICE.

ALEXANDER JAY WURTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

LIGHTNING-ARRESTER.

974,223. Specification of Letters Patent. Patented Nov. 1, 1910.

Application filed September 5, 1905. Serial No. 277,104.

To all whom it may concern:

Be it known that I, ALEXANDER J. WURTS, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Lightning-Arresters, of which the following is a specification.

My invention relates to lightning arresters or means for protecting high voltage electric circuits from injuries resulting from static discharges, and it has for its object to provide improved means of the character and for the purpose indicated.

Many of the devices for protecting electric circuits from lightning discharges comprise grounded circuit connections for the distributing conductors that include air spaces or spark gaps across which the static or lightning discharges may occur. In the use of such devices, arcs are frequently formed in the air spaces by the dynamo current that is supplied from the protected circuit after the disruptive discharges take place and various supplementary means have been employed for preventing the formation of such arcs or for causing rupture thereof immediately upon formation. The means which I propose to employ comprises a fuse which is destroyed and the supporting means for which may be shattered by the passage of current through or over it, and I further provide means for automatically replacing a destroyed fuse.

Figure 1 of the accompanying drawing, is a diagrammatic view of a system embodying my invention. Fig. 2 is a view, partially in side elevation and partially in section, of means for supporting the fuses and for automatically placing them in circuit, and Fig. 3 is a partial end view of the device shown in Fig. 2.

Arranged between supply conductors 1 and 2 that may be connected with any suitable source of electrical energy 3, are a plurality of parallel circuits 4, each of which includes a fuse 5 and a pair of serrated terminal pieces 6 and 7 with a spark gap or air space 8 between them. Each of the fuses 5 comprises a strip of ground glass 9 or other similar insulating material upon the surface of which a film or coating 10 of suitable conducting material such as graphite is applied, the mass of the conducting material being so small that only a negligible amount of gas or vapor is produced upon its being fused. Whenever the conductors 1 and 2 become statically charged by lightning or otherwise, discharges occur at one of the spark gaps 8 and current traverses the corresponding fuse 5, which is fused by the passage of the current through it, the glass supporting strips being shattered thereby, the circuit interrupted, and the continuation of the arc at the corresponding spark gap 8 prevented. Only one of the fuses will ordinarily be destroyed at a time and the remainder will serve as additional protection during similar discharges. The masses of the conducting coatings or films being very small almost inappreciable amounts of conducting gases or vapors will be formed when they are fused and no arcs will continue after the discharge.

It may be preferable in some cases to provide for the inclusion in the circuit of only a single fuse at a time and to that end I have provided a device which is shown in Figs. 2 and 3. Suitably supported upon the exterior of a rotatable drum 11 are a plurality of fuses 12, similar in character to the fuses 5 of Fig. 1, opposite ends of which are adapted to be engaged by brushes 13 and 14 at certain positions of the rotatable drum. The brush 13 is connected with one terminal 15 of a spark gap 16 the other terminal 17 of which is connected to a distributing conductor 18 and the brush 14 is connected to the ground at G. A stationary stop 19 is provided in the path of movement of the fuses 12 so that it engages the fuse which is in service in order to prevent rotation of the drum while the active fuse remains intact. Rotation of the drum may be effected, upon destruction of a fuse, by means of a spiral spring 20, one end of which is attached to the drum 11 and the other to a stationary shaft 21 upon which the drum 11 is mounted. Upon the occurrence of a discharge across the spark gap 16 the conducting film, which at that time is engaged by the brushes 13 and 14, is fused and the supporting strip is shattered, thereby permitting the spring 20 to actuate the drum and bring another strip into engagement with the stop 19 and its conducting film into engagement with the brushes 13 and 14.

I claim as my invention:

1. An electrical fuse comprising a plate of frangible insulating material and a film of

conducting material covering said plate, the passage of current through said material serving to destroy it and to fracture said plate.

2. An electrical fuse comprising a plate of frangible insulating material and a film of fusible conducting material upon its surface, the fusing of which fractures said plate.

3. An electrical fuse comprising a plate of frangible insulating material and a film of fusible conducting material covering its surface, destruction of which, by the passage of current therethrough, also ruptures the plate of insulating material, the mass of the conducting material being so small as to preclude the production of sufficient amounts of gases or vapors to form a conducting medium after the destruction of the fuse.

4. An electrical fuse comprising a non-conducting frangible body and a fusible conducting film covering its surface the fusing of which breaks said frangible body and produces only a negligible amount of conducting vapor.

In testimony whereof, I have hereunto subscribed my name this 21st day of August 1905.

ALEXANDER JAY WURTS.

Witnesses:

HIRAM A. TAYLOR,

OTTO S. SCHAIRER.